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INTRODUCTION

This document describes the steps required to implement the Hosted AT&T Skype4B service for the agencies, including the steps required to prepare and deploy a specific site. The responsible organization is listed after each step heading.

STEPS

1. SITE SURVEY

The Division of Enterprise Technology (DET) will proactively perform a Site Survey for all sites to identify the existing environment and to help determine any required upgrades or changes. Please note that the Site Survey may not involve an actual site visit but is rather a process used to gather the appropriate information required to get the site ready for the AT&T Hosted Skype4B service. This is some of the information that is identified during the Site Survey process:

a. Determine Resiliency Requirements for Access – **Agency and DET**

Low - Internet Only

Medium – BadgerNet Only

High – BadgerNet with Internet Backup

Custom – 4G Backup, Survivable Branch Appliance, etc.

b. Determine Capacity / Concurrent Audio Call Requirements –**DET**

100K per Concurrent Audio Call required

c. Switch Configuration – **DET**

The Ethernet switch should be POE capable or AC adapters will be required for each phone. All Skype4B phones included in the AT&T contract are 802.3af compatible (normal PoE). However, the Polycom Conference phone (Real Presence Trio) requires 802.3at (PoE+) if being used with the Visual + unit (for Video conferencing). A PoE+ adapter can be purchased on the AT&T contract for \$120 (one required for each phone).

The switches must also support LLDP (Link Layer Discovery Protocol) and it must be enabled.

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2. SITE INFORMATION COLLECTION

DET will provide each Agency a prepopulated Onboarding Workbook (a.k.a. Capture Document) with as much information as is available in the STAR system. It is the Agency's responsibility to ensure that this information is accurate and complete.

a. End-User Identification – **Agency and DET**

At a minimum, the End-User's Telephone Number, Email Address and Site must be correct. This is required for AT&T to configure User in Skype4B, Port the user's number and set up 911, etc. The Agency should also ensure that any updated End-User information is reflected in STAR and AD.

It is the responsibility of the Agency to verify End-User Microsoft Licensing (if required).

b. End-User Profile (Service Level) – **Agency**

Enhanced Profile

Basic Profile

Skype4B Online).

c. End-User Equipment - **Agency**

Skype4B Soft Client Only (Headset or USB Speakerphone)

Skype4B Phone (Model) and Skype4B Soft Client

d. Non-User Resource Telephone Lines – **Agency**

Includes Analog Lines, Room Resources / Conference Room phones, etc.

e. Identify any Response Group requirements – **Agency and DET**

Required for AT&T to configure Response Groups / Hunt Groups

3. SUBMIT CHANGE ORDER

Once the information is collected in the Onboarding Workbook, the Agency will submit a Change order to AT&T to begin the implementation process.

4. SITE PREPARATION

Following are the steps required to get a site ready for the AT&T Hosted Skype4B service:

a. WAN Configuration - **DET**

BadgerNet, BCN and / or Internet Access buildout based on Bandwidth requirements

b. LAN Configuration – **Agency and DET**

- QoS Configuration



QoS marking performed at the workstation and by Skype4B phones must be honored by all components in the following network paths:

- Between all workstation subnets (including Wi-Fi) / Voice VLAN subnets. This is required for User-to-User traffic.
- Between all workstation subnets (including Wi-Fi) / Voice VLAN subnets and the Skype4B servers (FE, Edge, and Mediation) at AT&T.
- Between all workstation subnets (including Wi-Fi) / Voice VLAN subnets and the Media end points (SBCs, etc.) at AT&T. This is required for media bypass.

The following table indicates the QoS values that will be used:

Traffic Type	Server Ports	Client Ports	QoS Value
Audio / SIP	UDP 50000 - 55999	UDP 50000 - 50049	DSCP 46 (EF)
Video / Media	UDP 56000 - 57999	UDP 50050 - 50099	DSCP 34 (AF41)
App Sharing / File Transfer	TCP 58000 - 59999	TCP 500100 - 50149	DSCP 24 (CS3)
Signaling / STUN / TURN	TCP 443, 5061 and UDP 3478	TCP 443, 5061 and UDP 3478	DSCP 24 (CS3)

This marking must be set at the Workstation via Group Policy (GPO). It is detailed here:

[https://technet.microsoft.com/en-us/library/jj205371\(v=ocs.15\).aspx](https://technet.microsoft.com/en-us/library/jj205371(v=ocs.15).aspx)

- VLAN Configuration

Separate Voice and Data VLANs will need to be configured at each site. The IP phones will join the Voice VLAN, while the Workstations will join the Data VLAN.

- DHCP Configuration

There are several DHCP options that must be set to allow Skype4B phones to connect to the Skype4B servers. These include but are not limited to the following:

- Option 2: Time Offset
- Option 15: Domain Name
- Option 42: NTP Server
- Option 54: Server Identifier (AT&T Skype4B Server)
- Option 55: Parameter request list
- Option 60: Class-identifier

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The following DHCP Options will be provided by the AT&T Skype4B server (the appropriate Firewall ports must be opened – UDP 67/68):

- Option 120: SIP Server DHCP Options
- Option 43: Vendor specific info (includes the following sub options):
 - sub-option 1 <UC Identifier>:
 - sub-option 2 <URL Scheme>:
 - sub-option 3 <Web Server FQDN>:
 - sub-option 4 <Port>:
 - sub-option 5 <Relative Path for Cert Prov>:

Details can be found here:

[https://technet.microsoft.com/en-us/library/gg398088\(v=ocs.14\).aspx](https://technet.microsoft.com/en-us/library/gg398088(v=ocs.14).aspx)

<http://www.myskypelab.com/2015/11/skype4b-lync-dhcp-config-tool.html>

c. DNS - Agency

If the Agency is not using the Accounts Domain and / or does not have access to the GTM Delegated DNS, the following DNS records will be required in their Internal DNS Servers:

Please note that one of each record will be required for each domain name:

DNS Entry	Record Type	Target	Port / Service Protocol
lyncdiscoverinternal.vanitydomain.gov	A	AT&T FE Server Pool or Load Balancer	
_sipinternaltls._tcp.vanitydomain.gov	SRV	AT&T FE Server Pool or Load Balancer	TCP 5061

These are normally handled by GTM Delegated DNS Records.

Setting up a new Vanity Domain in Skype4B requires additional Local and External DNS entries (set by DET). This is described in a separate document.

Please note that we plan to use the Internet as a backup for the AVPN. The Skype4B client will initially query the Internal DNS entry lyncdiscoverinternal.vanitydomain.gov record to obtain the Internal IP Address (routing over the AVPN). If the internal DNS query fails or the connection attempt to the resolved internal IP Address fails, the client will automatically query the External DNS entry lyncdiscover.vanitydomain.gov to obtain the External IP Addresses (routing over the Internet).

d. NAC / ICE Setup – Agency and DET

The MAC Addresses of the IP phones need to be provided from the Agency to DET so they can be populated in the NAC. The IP Phone MAC addresses are already captured in the Agency Onboarding Workbook (required for the AT&T IP phone management system). These MAC addresses can be taken from this spreadsheet and bulk loaded to the NAC.



e. Equipment Setup – **Agency, DET and AT&T**

- Switches

The Ethernet switch should be PoE capable. All Skype4B phones included in the AT&T contract are 802.3af compatible (normal PoE). However, the Polycom Conference phone (Real Presence Trio) requires 802.3at (PoE+) if being used with the Visual + unit (for Video conferencing). A PoE+ adapter can be purchased on the AT&T contract for \$120 (one required for each phone).

The switches must also support LLDP (Link Layer Discovery Protocol) and it must be enabled.

- SBA (Survivable Branch Appliance)

An SBA is used for Site Resiliency. It provides a mechanism for the Skype4B phones to register locally and offer public switched telephone network (PSTN) connectivity if the connection to the AT&T Skype4B system is lost. There is an Audio Codes SBA listed in the AT&T Contract.

- Analog GWs

The Analog GWs are used to support Analog / Plain Old Telephone Service (POTS) lines that cannot be converted to normal Skype4B lines or moved to another technology.

- Skype4B Phones (AT&T Responsibility if purchased from them)

- Skype4B Client Install on PCs

f. Firewall Configuration – **DET**

The following ports should be opened between all workstation subnets (including Wi-Fi) / Voice VLAN subnets.

- TCP: 80, 443, 5061, 5223, 8057, 50000-50149
- UDP: 3478, 50000-50149

This is required for User-to-User traffic.

The following ports should be opened between all workstation subnets (including Wi-Fi) / Voice VLAN subnets and the Skype4B servers (FE, Edge and Mediation) at AT&T.

- TCP: 80, 443, 5061, 5223, 8057, 50000-59999
- UDP: 67, 68, 3478, 50000-59999

The following ports should be opened between all workstation subnets (including Wi-Fi) / Voice VLAN subnets and the Media end points (SBCs, etc.) at AT&T.

- TCP: 443, 50000-59999
- UDP: 3478, 50000-59999

This is required for media bypass.



- g. Zscaler Configuration (required for Skype4B Online) – **DET**
Zscaler should be used at all sites for access to O365 for Skype4B Online integration and Exchange Online UM for Voicemail. Both the Workstation Subnets and Voice VLAN subnets should route all traffic destined for O365 (i.e. *.lync.com) via Zscaler. Please note that this is applicable to Agencies using Skype4B Online and not required for the AT&T Hosted Skype4B service.
- h. Site Configuration in Skype4B - **AT&T**
- i. End User Configuration in Skype4B - **AT&T**
- j. Response Group Configuration - **AT&T**
- k. Training – **Agency and AT&T**

5. SITE TURN-UP

- a. Follow Site Preparation steps (above) for users / sites – **DET and AT&T**
- b. Set up new users in Skype4B – **AT&T**
- c. Configure the DIDs in Skype4B – **AT&T**
- d. Port Centrex numbers – **AT&T**
- e. Testing – **Agency, DET and AT&T**

Document Revision History

Date	Version	Editor / Author	Notes
8/10/2017	1.0	Daniel Foelker / R. Haile	Initial version